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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/600,980	06/20/2003	Yasunori Matsumura	1217-031149	7148

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EXAMINER

TRAN, LONG K

ART UNIT PAPER NUMBER

2818

DATE MAILED: 07/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/600,980

Applicant(s)

MATSUMURA ET AL.

Examiner

Long K. Tran

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on PreAmdt on June 20, 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 - 8 is/are rejected.
- 7) ☒ Claim(s) 1 - 4 and 6 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10/27/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Response to Preliminary Amendment

1. This office action is in response to Preliminary Amendment filed on June 20, 2003.

Priority

2. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed on June 20, 2003.

Information Disclosure Statement

3. This office acknowledges of the following items from the Applicant:
Information Disclosure Statement (IDS) filed on October 27, 2003.
The references cited on the PTO -1449 form have been considered.

Specification

4. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of **50 to 150 words**. ***It is important that the abstract not exceed 150 words in length since the space provided for the abstract*** on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The

disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

5. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

6. Claims 1 – 4 are objected to because of the following informalities:

Claim 1: change "the average thickness" to -- an average thickness --;

Claim 2: change "the ratio" to --a ratio --; and change "the average thickness of the surface" to --an average thickness of the surface--;

Claim 3: change "the ratio" to --a ratio --; and change "the average thickness of the undercoating" to --an average thickness of the undercoating--;

Claim 4: change "the ratio" to --a ratio --; and change "the average thickness of the undercoating" to --an average thickness of the undercoating--;

Claim 6: change "wherein the surface" to --wherein a surface--;

Appropriate correction is required.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims **1, 7 and 8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Igarashi et al. (US Patent No. 5,990,546).

Regarding claims **1** and **7**, Igarashi et al. disclose a chip-scaled package type semiconductor device (with TAB method) comprising an insulating 24 (fig. 8) and group of wiring P (fig. 8); each of the wiring pattern includes routing conductor 23 (fig. 8) and metal 213 (Fig. 8) same as conductive metal 213 (fig. 3(C)) (It is noted that bump is part of a conductive metal used to connect wiring pattern to a chip element, wherein metal layer may include gold, palladium, nickel and copper. See: column 2, lines 15 – 16; column 5, lines 45 – 50; and column 9, lines 15 – 30.

Igarashi et al. silence on an average thickness of palladium is not more than about 0.04 μm . However, it would have been well known in the art that the selection of those parameters such as **energy, concentration, temperature, time, molar fraction, depth, thickness, etc.**, would have been obvious and involve routine optimization which has been held to be within the level of ordinary skill in the art. "Normally, it is to be expected that a change in **energy, concentration, temperature, time, molar fraction, depth, thickness, etc., or in combination of the parameters** would be an unpatentable modification. Under some circumstances, however, changes such as these may impart patentability to a process if the particular ranges claimed produce a new and unexpected result which is different in kind and not merely degree from the results of the prior art ... such ranges are termed "critical ranges and the applicant has the burden of proving such criticality.... More particularly, where the general conditions of a claim

are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller* 105 USPQ233, 255 (CCPA 1955). See also *In re Waite* 77 USPQ 586 (CCPA 1948); *In re Scherl* 70 USPQ 204 (CCPA 1946); *In re Irmischer* 66 USPQ 314 (CCPA 1945); *In re Norman* 66 USPQ 308 (CCPA 1945); *In re Swenson* 56 USPQ 372 (CCPA 1942); *In re Sola* 25 USPQ 433 (CCPA 1935); *In re Dreyfus* 24 USPQ 52 (CCPA 1934).

Moreover, the thickness of palladium has not been alleged by applicant to be of significant importance for patentability.

Regarding claim 8, Igarashi et al. disclose conductive metal 213 (fig. 3(C)) included copper (column 5, line 49 – 50).

9. Claims 1, 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mori et al. (US Patent No. 5,821,627).

Regarding claims 1 and 7, Mori et al. disclose an electronic circuit device is mainly arranged such that an insulating substrate having a wiring pattern 14 (figs. 15 and 16 A – 16 C) and bump B (figs. 15 and 16 A – 16 C). It is noted that bump is part of a conductive metal used to connect wiring pattern to a chip element (column 9, line 34 – 41); wherein metal layer B includes an undercoat nickel layer; an intermediate palladium layer; and an electroplated gold surface layer on top of palladium layer (column 17, lines 15 – 24).

Mori et al. do not explicitly specify an average thickness of palladium is not more than about 0.04 μm .

However, it would have been well known in the art that the selection of those parameters such as **energy, concentration, temperature, time, molar fraction, depth, thickness, etc.**, would have been obvious and involve routine optimization which has been held to be within the level of ordinary skill in the art. "Normally, it is to be expected that a change in **energy, concentration, temperature, time, molar fraction, depth, thickness, etc.**, or in combination of the parameters would be an unpatentable modification. Under some circumstances, however, changes such as these may impart patentability to a process if the particular ranges claimed produce a new and unexpected result which is different in kind and not merely degree from the results of the prior art ... such ranges are termed "critical ranges and the applicant has the burden of proving such criticality.... More particularly, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller* 105 USPQ233, 255 (CCPA 1955). See also *In re Waite* 77 USPQ 586 (CCPA 1948); *In re Scherl* 70 USPQ 204 (CCPA 1946); *In re Irmischer* 66 USPQ 314 (CCPA 1945); *In re Norman* 66 USPQ 308 (CCPA 1945); *In re Swenson* 56 USPQ 372 (CCPA 1942); *In re Sola* 25 USPQ 433 (CCPA 1935); *In re Dreyfus* 24 USPQ 52 (CCPA 1934).

Moreover, the thickness of palladium has not been alleged by applicant to be of significant importance for patentability.

Regarding claim 8, Mori et al disclose wiring layer consisting of copper (abstract).

10. Claims 2 – 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Igarashi et al. (US Patent No. 5,990,546) or Mori et al. (US Patent No. 5,821,627).

Regarding claims 2 – 6, Igarashi et al. or Mori et al. disclose the claimed invention of claim 1 except for a ratio of the average thickness of the intermediate layer containing palladium to an average thickness of the surface layer containing gold is in the range of about 1:2.5 to about 1:1000 (as cited in claim 2); a ratio of the average thickness of the intermediate layer containing palladium to an average thickness of the undercoating layer containing nickel is in the range of about 1:2.5 to about 1:2500 (as cited in claim 3); a ratio of the average thickness of the surface layer containing gold to an average thickness of the undercoating layer containing nickel is in the range of about 1:0.05 to about 1:50 (as cited in claim 4); a surface of the surface layer containing gold having gold content of not less than about 93% by atom and has nickel content of not more than about 5% by atom (as cited in claim 5); and a surface of the surface layer containing gold has copper content of no more than about 3% by atom (as cited in claim 6).

However, it would have been well known in the art that the selection of those parameters such as **energy, concentration, temperature, time, molar fraction, depth, thickness, etc.**, would have been obvious and involve routine optimization which has been held to be within the level of ordinary skill in the art. "Normally, it is to be expected that a change in **energy, concentration, temperature, time, molar fraction, depth, thickness, etc., or in combination of the parameters** would be an unpatentable modification. Under some circumstances, however, changes such as these may impart patentability to a process if the particular ranges claimed produce a new and

unexpected result which is different in kind and not merely degree from the results of the prior art ... such ranges are termed "critical ranges and the applicant has the burden of proving such criticality.... More particularly, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller* 105 USPQ233, 255 (CCPA 1955). See also *In re Waite* 77 USPQ 586 (CCPA 1948); *In re Scherl* 70 USPQ 204 (CCPA 1946); *In re Irmischer* 66 USPQ 314 (CCPA 1945); *In re Norman* 66 USPQ 308 (CCPA 1945); *In re Swenson* 56 USPQ 372 (CCPA 1942); *In re Sola* 25 USPQ 433 (CCPA 1935); *In re Dreyfus* 24 USPQ 52 (CCPA 1934).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Long K. Tran whose telephone number is 571-272-1797. The examiner can normally be reached on Mon-Thu.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on 571-272-1787. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Long Tran



July 29, 2004



David Neims
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